No change in post-myocardial infarction prognostic factors

See page 99 for the article to which this Editorial refers

Plus ça change, plus c'est la même chose — The more things change, the more they remain the same.

Alphonse Karr (1808–1890): Les Guêpes, 1849

The article by Touboul and colleagues in this issue\(^1\) adds another chapter to the voluminous literature already extant concerning the prognosis of the post-myocardial infarction patient. These collaborators from Lyon report the first results from their comprehensive, prospective observations in 471 patients with acute myocardial infarction. The overwhelming majority (90%) of the patients were men; the mean age of the population was 56 years. Slightly less than 90% of the patients had suffered a Q wave myocardial infarction; 45% received thrombolytic therapy, 62% received beta-blockers and 74% were treated with antiplatelet agents. The population seems quite contemporary in all respects except for the small number of women present. Certainly, the therapeutic interventions are typical of a modern coronary care unit. The protocol employed in this series was demanding. Patients underwent a daunting array of non-invasive and invasive tests, the outcomes of which were compared with one-year and 31-month mortality. Factors examined included history, physical examination, chest X-ray, electrocardiogram, 24 h electrocardiographic monitoring for arrhythmia and heart rate variability, radionuclear left ventricular ejection fraction during rest and exercise, signal averaged electrocardiography, and invasive electrophysiology with right ventricular stimulation for induction of ventricular arrhythmias. Clearly, a demanding protocol for the investigators and the patients.

It is important to note that only patients who survived the first 10 days after infarction were included in the follow-up. Presumably, the investigators felt that anyone not surviving this minimal period of time had suffered an extensive infarct possibly complicated by cardiogenic shock and undoubtedly with poor residual left ventricular function and hence had a very poor short- and long-term prognosis. Similarly, patients over the age of 75 were not included in the observed cohort. Thus, many high-risk patients were excluded from the study. This factor should be remembered when one notes the very low 12 (5-5%) and 31 (8-4%) month fatality rates, figures similar to those obtained in many of the mega-trials of thrombolytic therapy. These latter studies also generally excluded elderly individuals and patients with severe left ventricular failure. Mortality was low regardless of whether patients received thrombolytic therapy (4-2%) or not (6-7%).

The results of the current study resemble in many ways the findings of earlier studies from the pre-thrombolytic era, a fact commented upon by the authors. Thus, reduced left ventricular function, poor exercise performance, inability to perform an exercise test, reduced heart rate variability, and the presence of abnormal electrocardiographic late potentials predicted reduced survival in univariate analyses. Of particular interest was the observation that mortality was not predicted by the presence or absence of ventricular arrhythmias, ST segment shifts during or after exercise, changes in left ventricular ejection fraction during exercise, and electrophysiologic induction of sustained ventricular tachycardia. Multivariate analysis demonstrated that only a history of heart failure or prior infarction, reduced heart rate variability and left ventricular ejection fraction, and abnormal electrocardiographic late potentials were of value in predicting mortality. Prognostic factors operative at 12 and at 31 months were essentially the same. Similar findings have been reported in studies

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performed on patients who did not receive thrombolytic therapy, as noted by the authors in the discussion of their findings. Therefore, the answer to the question ‘Have post-myocardial infarction prognostic factors changed in the thrombolytic era?’ is clearly ‘no’.

It is impossible to read such a comprehensive study without wanting to ask the authors innumerable questions. For example, ‘Would the results have been different if patients who died during the first 10 days after infarction had been included?’ ‘Were coronary arteriograms obtained on any of the patients and was this information of prognostic value?’ ‘Why were there so few women in the study?’ and so on and so on. Perhaps future papers from this group will reveal the answers to these questions and many more that occurred to me while reading this interesting paper. Nevertheless, the ‘take home’ message is clear: Prognostic factors following acute myocardial infarction remain unchanged despite modern coronary care therapeutic interventions.

Perhaps this is not such a surprising conclusion after all. The residual functioning myocardium that determines a good or a poor long-term outcome does not take prior therapy or the number of previous infarcts into account. This amount of myocardium is a relatively fixed value irrespective of how the patient got there: one large infarct left untreated or many smaller infarcts treated successfully with thrombolytic therapy. The same point can be made about the underlying substrate for malignant and eventually fatal ventricular arrhythmias. In the final prognostic analysis, it makes no difference how an individual patient arrives at a particular level of left ventricular function, one infarct or many, effective therapy or no therapy. The residual functioning myocardium and its potential arrhythmic substrate determine the short and long-term outlook for the patient regardless of the route taken to get to that particular state of left ventricular anatomy and function.

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